

REMARKS

Reconsideration and timely allowance of the pending claims, in view of the following remarks, are respectfully requested.

In the pending Office Action, the Examiner rejected claims 1-4, 6-13, and 15-17, under 35 U.S.C. §103(a), as being unpatentable over Kojima '843 (U.S. Patent No. 6,027,843). The Examiner also objected to the drawings, specification, and claims 5-7 and 14-16 as containing minor informalities and typographical errors.

Prior to this Amendment, claims 1-17 were pending, of which claims 1-10 were independent. By this Amendment, replacement sheet for FIG. 1A has been submitted and the specification regarding paragraphs [0053], [0055], [0089] has been amended to correct the informalities indicated by the Examiner.

With respect to the remaining objections to the specification and drawings, Applicants have introduced new paragraph [0028A] and new FIG. 2E and have amended paragraph [0034] to reflect the introduction of new FIG. 2E. Applicants submit that new FIG. 2E does not, in any way, introduce new matter. Rather, FIG. 2E illustrates features, such as an exposure apparatus, a measurement apparatus, a processing mechanism, and a reticle stage actuation mechanism that have been recited in the original as-filed claims and/or already described in other sections of the specification as filed. (*See, e.g.*, Substitute Specification: para. [0035] – [0038], [00127] – [00132]; FIGs. 1A, 1B, 3A). As such, Applicants submit that new paragraph [0028A], new FIG. 2E, and amended paragraph [0034] comply with the mandates of 35 U.S.C. §112 as well as MPEP §608.01(I). Accordingly, Applicants respectfully request the withdrawal of all objections regarding the specification and drawings.

By this Amendment, Applicants have introduced new dependent claims 18-19 and also amended claims 5-7 and 14-16 to correct the minor informalities indicated by the Examiner. Accordingly, Applicants, respectfully request the withdrawal of all objections regarding t claims 5-7 and 14-16.

Applicants respectfully traverse the prior art rejections, under 35 U.S.C. §103(a), for the following reasons.

I. Prior Art Rejections Under 35 U.S.C. §103(a)

Independent claim 1, as amended, sets forth a method of calibrating a reticle stage of a lithographic system, comprising, *inter alia*:

measuring a set of height offsets based on said reticle image;
decomposing said set of measured height offsets into a plurality of distortional factors;
determining reticle deformation attributes *based on said distortional factors;*
determining reticle stage deformation attributes *based on said distortional factors* and said reticle deformation attributes; and
calibrating said reticle stage based on said reticle stage deformation attributes.

The claimed invention is directed to calibrating a reticle stage that is independent of the reticle. In this regard, independent claim 1 recites that the measured height offsets are decomposed into a plurality of distortional factors. This is amply supported by the described embodiments, which provide that upon acquiring height offset data, the data is decomposed into constituent factors that represent distortional factors. (*See, e.g.*, Substitute Specification, par. [0040]-[0049], [0070]-[0071]).

Claim 1 then positively recites that the reticle deformation and the reticle stage deformation are subsequently determined, based on the decomposed distortional factors, which then enables the calibration of the reticle stage solely on the reticle stage deformation. (*See, e.g.*, Substitute Specification, par. [00122], [00126]-[00127], [00131]).

Unlike the present invention, however, the Kojima '843 reference fails to teach the combination of features including decomposing the set of measured height offsets into a plurality of distortional factors, determining reticle deformation attributes based on the distortional factors, and determining the reticle stage deformation attributes

based on said distortional factors, as required by independent claim 1. For example, Kojima '843 discloses that corrections can be performed by detecting the “height” of the substrate using sensors and then correcting any detected errors. Kojima '843 then discloses that the corrections can be made from data concerning the position of the reticle and data that are used in calculations establishing a relationship between magnitude of required correction and magnitude of deflection. (*See*, col. 9, lines 3-18).

Kojima '843 also discloses that corrections for defocusing caused by flatness deviations of the substrate and/or reticle must be implemented in real time during projection exposure. Such real-time correction is desirably performed by the stage-correction device because the magnitude of correction can be substantial but the period of corrections is typically relatively long. (*See*, col. 10, lines 30-47).

Kojima '843 further discloses that focus corrections of the reticle are performed by manipulating the reticle stage, and rotation and focus correction of the substrate are performed by manipulating the substrate stage so that errors are directly detected and corrected without having to execute complex correction calculations that are otherwise required when, for example, height displacement of the reticle is corrected by manipulating the substrate stage and vice versa. (*See*, col. 11, lines 25-32).

There is, however, nothing in Kojima '843 that teaches decomposing the set of measured height offsets into a plurality of distortional factors – much less suggest determining reticle deformations based on the distortional factors and determining the reticle stage deformation based on said distortional factors, as required by amended claim 1. In fact, as best understood, there is nothing in Kojima '843 that even distinguishes between reticle deformation attributes and reticle stage deformation attributes.

For the reasons discussed above, Applicants submit that amended independent claim 1 is patentably distinguishable over Kojima '843. In addition, claims 2-9 and new claim 18 are also patentable by virtue of their dependency to claim 1 as well as for their additional recitations. Moreover, because independent claim 10 recites similar features claim 1, claim 10 is patentable for at least the reasons presented with respect to

claim 1. Dependent claims 11-17 and new claim 19 are also patentable by virtue of their dependency to claim 10 as well as their additional recitations. Accordingly, withdrawal of all prior art rejections, under 35 U.S.C. § 103(a) is respectfully requested.

II. Conclusion

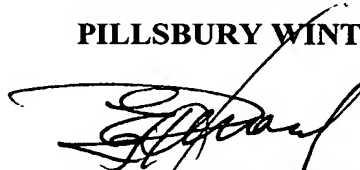
All matters having been addressed, Applicants respectfully requests the entry of this Amendment, the Examiner's reconsideration of this application, and the immediate allowance of pending claims 1-19.

Applicant's Counsel remains ready to assist the Examiner in any way to facilitate and expedite the prosecution of this matter.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

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